App. No. 09/506,318
Office Action Dated April 21, 2005

Amendments to the Claims:

This listing of claims will replace all prior versions and listing of claims in the application.

Claims 13, 25, 39, and 51 are amended.

Claims 67-70 are new.

Listing of Claims:

1-12. (Canceled)

13. (Currently Amended) A circuit board prepreg comprising:
a short fiber nonwoven fabric comprising thermal-resistant synthetic fibers;
an inorganic binder; and
a resin varnish,
wherein the prepreg is manufactured by bonding the synthetic fibers with the inorganic binder, and after the bonding impregnating the nonwoven fabric with a resin varnish and semi-curing,
wherein the thermal-resistant synthetic fibers intersect each other forming intersections;
wherein the thermal-resistant synthetic fibers are bound with the inorganic binder at the intersections,
wherein the inorganic binder surrounds the thermal-resistant synthetic fibers at the intersections of the fibers and at portions of the fibers other than at intersections, and
wherein the inorganic binder comprises an insulating material having a higher softening temperature than that of the resin varnish impregnated therein so as not to be softened during the semi-curing.

14. (Original) The prepreg according to claim 13, wherein the resin varnish is at least one selected from the group consisting of an epoxy resin, a polyimide resin, a phenol resin, a fluorine resin, and a cyanate ester resin.

15. (Canceled)

16. (Original) The prepreg according to claim 13, wherein the thermal-resistant synthetic fibers are at least one kind of fibers selected from the group consisting of poly(p-phenylene-2,6-benzobisoxazole) fibers, polybenzimidazole fibers, aramid fibers, polytetrafluoroethylene fibers, and poly(p-phenylene-2,6-benzobisthiazole) fibers.

17. (Original) The prepreg according to claim 13, wherein the inorganic binder is a residue formed from either a solution of low melting point glass or a water-dispersible colloidal solution in which at least either fibers of low melting point glass or particles of low melting point glass are dispersed.

18. (Original) The prepreg according to claim 13, wherein the fibers are bound with a chemical covalent siloxane bonding.

19. (Original) The prepreg according to claim 13, wherein the content of the inorganic binder ranges from 5 to 40 weight parts when the thermal-resistant synthetic fibers are 100 weight parts.

20. (Original) The prepreg according to claim 13, wherein the fineness of the thermal-resistant synthetic fibers ranges from 0.25 to 4 denier.

21. (Original) The prepreg according to claim 13, wherein the length of the thermal-resistant synthetic fibers ranges from 1 to 6mm.

22. (Original) The prepreg according to claim 13, wherein the nonwoven fabric is obtained by a wet formation method.

23. (Original) The prepreg according to claim 13, wherein the weight of the prepreg ranges from 40 to 200g/m^2.

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24. (Original) The prepreg according to claim 13, wherein the average thickness of the prepreg ranges from 0.04 to 0.2mm.

25. (Currently Amended) A circuit board comprising a prepreg as an insulator, wherein the prepreg is prepared from a nonwoven fabric comprising short fibers bound with an inorganic binder, by impregnating the nonwoven fabric with a resin varnish and semi-curing,

wherein the thermal-resistant synthetic fibers intersect each other forming intersections; wherein the thermal-resistant synthetic fibers are bound with the inorganic binder at the intersections,

wherein the inorganic binder surrounds the thermal-resistant synthetic fibers at the intersections of the fibers and at portions of the fibers other than at intersections, and

wherein the inorganic binder comprises an insulating material having a higher softening temperature than that of the resin varnish impregnated therein so as not be softened during the semi-curing.

26. (Original) The circuit board according to claim 25, wherein the resin varnish is at least one selected from the group consisting of an epoxy resin, a polyimide resin, a phenol resin, a fluorine resin and a cyanate ester resin.

27. (Canceled)

28. (Original) The circuit board according to claim 25, wherein the thermal resistant synthetic fibers are at least one kind of fibers selected from the group consisting of poly(p-phenylene-2,6-benzobisoxazole) fibers, polybenzimidazole fibers, aramid fibers, polytetrafluoroethylene fibers, and poly(p-phenylene-2,6-benzobisthiazole) fibers.

29. (Original) The circuit board according to claim 25, wherein the inorganic binder is a residue formed from either a solution of low melting point glass or a water-dispersible colloidal solution in which at least either fibers of low melting point glass or particles of low melting point glass are dispersed.

30. (Original) The circuit board according to claim 25, wherein the fibers are bound with a chemical covalent siloxane bonding.

31. (Original) The circuit board according to claim 25, wherein the content of the inorganic binder ranges from 5 to 40 weight parts when the thermal-resistant synthetic fibers are 100 weight parts.

32. (Original) The circuit board according to claim 25, wherein the fineness of the thermal-resistant synthetic fibers ranges from 0.25 to 4 denier.

33. (Original) The circuit board according to claim 25, wherein the length of the thermal-resistant synthetic fibers ranges from 1 to 6mm.

34. (Original) The circuit board according to claim 25, wherein the nonwoven fabric is obtained by a wet formation method.

35. (Original) The circuit board according to claim 25, whercin the weight of the circuit board ranges from 45 to 400 g/m^2.

36. (Original) The circuit board according to claim 25, wherein the average thickness of the circuit board ranges from 0.05 to 2mm.

37. (Previously presented) The prepreg according to claim 13, wherein the inorganic binder is a low melting point glass.

38. (Previously presented) The circuit board according to claim 25, wherein the inorganic binder is a low melting point glass.

39. (Currently Amended) A circuit board prepreg comprising:
a short fiber nonwoven fabric comprising thermal-resistant synthetic fibers;

an inorganic binder; and

a resin varnish,

wherein the thermal-resistant synthetic fibers intersect each other forming intersections; wherein the thermal-resistant synthetic fibers are bound with the inorganic binder at the intersections,

wherein the nonwoven fabric is impregnated with the resin varnish and semi-cured,

wherein the inorganic binder surrounds the thermal-resistant synthetic fibers at the intersections of the fibers and at portions of the fibers other than at intersections, and

wherein the inorganic binder comprises an insulating material having a higher softening temperature than that of the resin varnish impregnated therein so as not to be softened during the semi-curing.

40. (Previously presented) The prepreg according to claim 39, wherein the resin varnish is at least one selected from the group consisting of an epoxy resin, a polyimide resin, a phenol resin, a fluorine resin and a cyanate ester resin.

41. (Previously presented) The prepreg according to claim 39, wherein the thermal-resistant synthetic fibers are at least one kind of fibers selected from the group consisting of poly(p-phenylene-2,6-benzobisoxazole) fibers, polybenzimidazole fibers, aramid fibers, polytetrafluoroethylene fibers, and poly(p-phenylene-2,6-benzobisthiazole) fibers.

42. (Previously presented) The prepreg according to claim 39, wherein the inorganic binder is a residue formed from either a solution of low melting point glass or a water-dispersible colloidal solution in which at least either fibers of low melting point glass or particles of low melting point glass are dispersed.

43. (Previously presented) The prepreg according to claim 39, wherein the fibers are bound with a chemical covalent siloxane bonding.

44. (Previously presented) The prepreg according to claim 39, wherein the content of the inorganic binder ranges from 5 to 40 weight parts when the thermal-resistant synthetic fibers are 100 weight parts.

45. (Previously presented) The prepreg according to claim 39, wherein the fineness of the thermal-resistant synthetic fibers ranges from 0.25 to 4 denier.

46. (Previously presented) The prepreg according to claim 39, wherein the length of the thermal-resistant synthetic fibers ranges from 1 to 6mm.

47. (Previously presented) The prepreg according to claim 39, wherein the nonwoven fabric is obtained by a wet formation method.

48. (Previously presented) The prepreg according to claim 39, wherein the weight of the prepreg ranges from 40 to 200g/m^2.

49. (Previously presented) The prepreg according to claim 39, wherein the average thickness of the prepreg ranges from 0.04 to 0.2mm.

50. (Previously presented) The prepreg according to claim 39, wherein the inorganic binder is a low melting point glass.

51. (Currently Amended) A circuit board comprising:

an insulator, and

wiring pattern on the insulator,

wherein the insulator comprises a short fiber nonwoven fabric comprising thermal-resistant synthetic fibers, an inorganic binder, and a resin varnish,

wherein the thermal-resistant synthetic fibers intersect each other forming intersections; wherein the thermal-resistant synthetic fibers are bound with the inorganic binder at the intersections,

wherein the nonwoven fabric material is impregnated with the resin varnish and semi-cured,

wherein the inorganic binder surrounds the thermal-resistant synthetic fibers at the intersections of the fibers and at portions of the fibers other than at intersections, and

wherein the inorganic binder comprises an insulating material having a higher softening temperature than that of the resin varnish impregnated therein so as not to be softened during the semi-curing.

52. (Previously presented) The circuit board according to claim 51, wherein the resin varnish is at least one selected from the group consisting of an epoxy resin, a polyimide resin, a phenol resin, a fluorine resin and a cyanate ester resin.

53. (Previously presented) The circuit board according to claim 51, wherein the thermal resistant synthetic fibers are at least one kind of fibers selected from the group consisting of poly(p-phenylene-2,6-benzobisoxazole) fibers, polybenzimidazole fibers, aramid fibers, polytetrafluoroethylene fibers, and poly(p-phenylene-2,6-benzobisthiazole) fibers.

54. (Previously presented) The circuit board according to claim 51, wherein the inorganic binder is a residue formed from either a solution of low melting point glass or a water-dispersible colloidal solution in which at least either fibers of low melting point glass or particles of low melting point glass are dispersed.

55. (Previously presented) The circuit board according to claim 51, wherein the fibers are bound with a chemical covalent siloxane bonding.

56. (Previously presented) The circuit board according to claim 51, wherein the content of the inorganic binder ranges from 5 to 40 weight parts when the thermal-resistant synthetic fibers are 100 weight parts.

57. (Previously presented) The circuit board according to claim 51, wherein the fineness of the thermal-resistant synthetic fibers ranges from 0.25 to 4 denier.

58. (Previously presented) The circuit board according to claim 51, wherein the length of the thermal-resistant synthetic fibers ranges from 1 to 6mm.

59. (Previously presented) The circuit board according to claim 51, wherein the nonwoven fabric is obtained by a wet formation method.

60. (Previously presented) The circuit board according to claim 51, wherein the weight of the circuit board ranges from 45 to 400g/m^2.

61. (Previously presented) The circuit board according to claim 51, wherein the average thickness of the circuit board ranges from 0.05 to 2mm.

62. (Previously presented) The circuit board according to claim 51, wherein the inorganic binder is a low melting point glass.

63. (Previously presented) The prepreg of claim 13, the thermal-resistant synthetic fibers comprising intersecting areas and remaining areas, the inorganic binder coating the remaining areas.

64. (Previously presented) The circuit board according to claim 25, the thermal-resistant synthetic fibers comprising intersecting areas and remaining areas, the inorganic binder coating the remaining areas.

65. (Previously presented) The prepreg according to claim 39, the thermal-resistant synthetic fibers comprising intersecting areas and remaining areas, the inorganic binder coating the remaining areas.

66. (Previously presented) The circuit board according to claim 51, the thermal-resistant synthetic fibers comprising intersecting areas and remaining areas, the inorganic binder coating the remaining areas.

67. (New) The prepreg according to claim 13, wherein the softening temperature of the inorganic binder is 350°C or more.

68. (New) The circuit board according to claim 25, wherein the softening temperature of the inorganic binder is 350°C or more.

69. (New) The prepreg according to claim 39, wherein the softening temperature of the inorganic binder is 350°C or more.

70. (New) The circuit board according to claim 51, wherein the softening temperature of the inorganic binder is 350°C or more.